

# Reproductive performance of female moose in an expanding population in southwest Alaska

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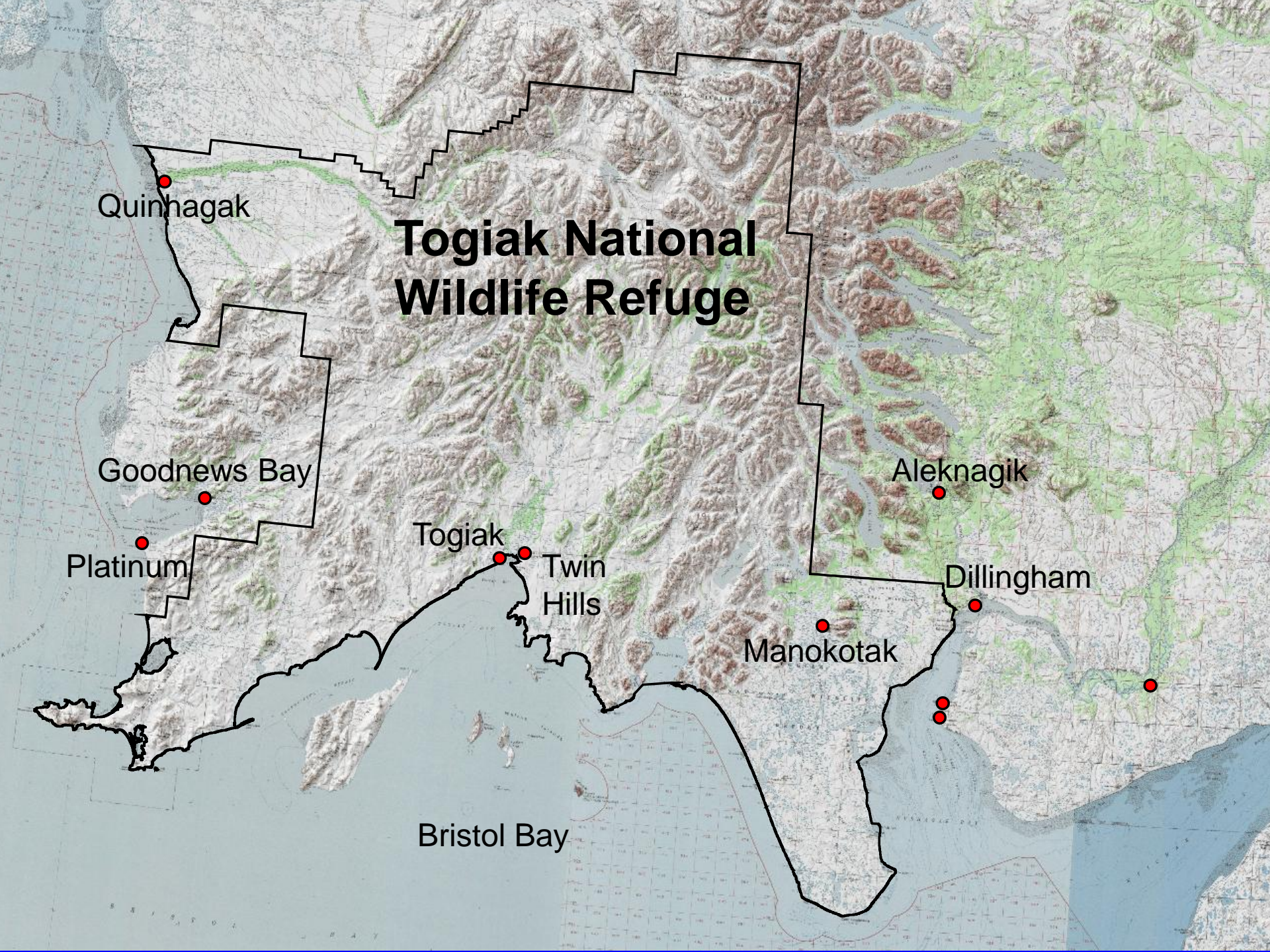




# TOGIAK NATIONAL WILDLIFE REFUGE







# Togiak National Wildlife Refuge

Quinhagak

Goodnews Bay

Platinum

Togiak

Twin Hills

Aleknagik

Dillingham

Manokotak

Bristol Bay











**40.4 brown bears/1000 km<sup>2</sup>**  
**(95% C.I. = 31.4 – 51.5 bears/1000 km<sup>2</sup>)**  
**Walsh et al. 2010**

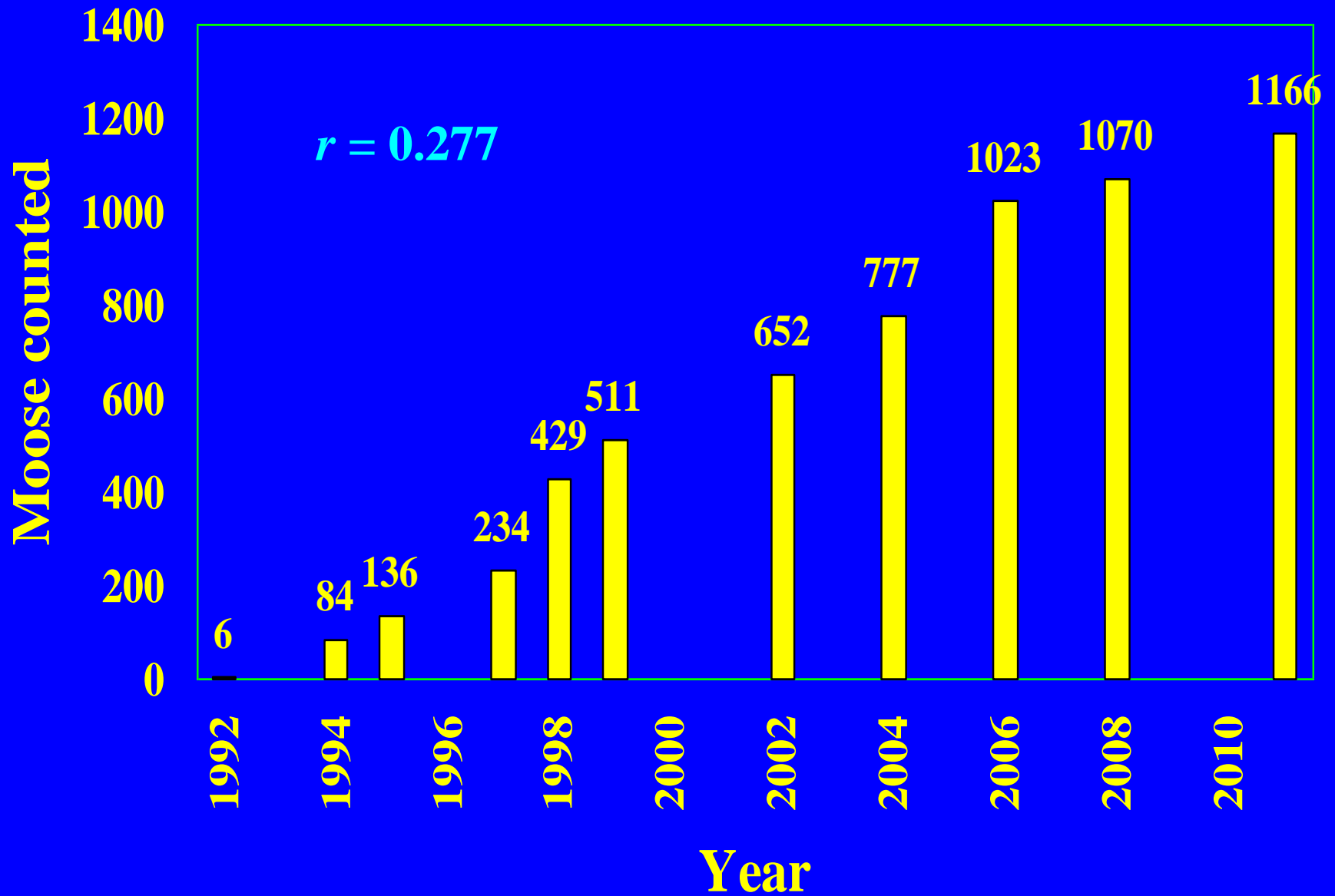




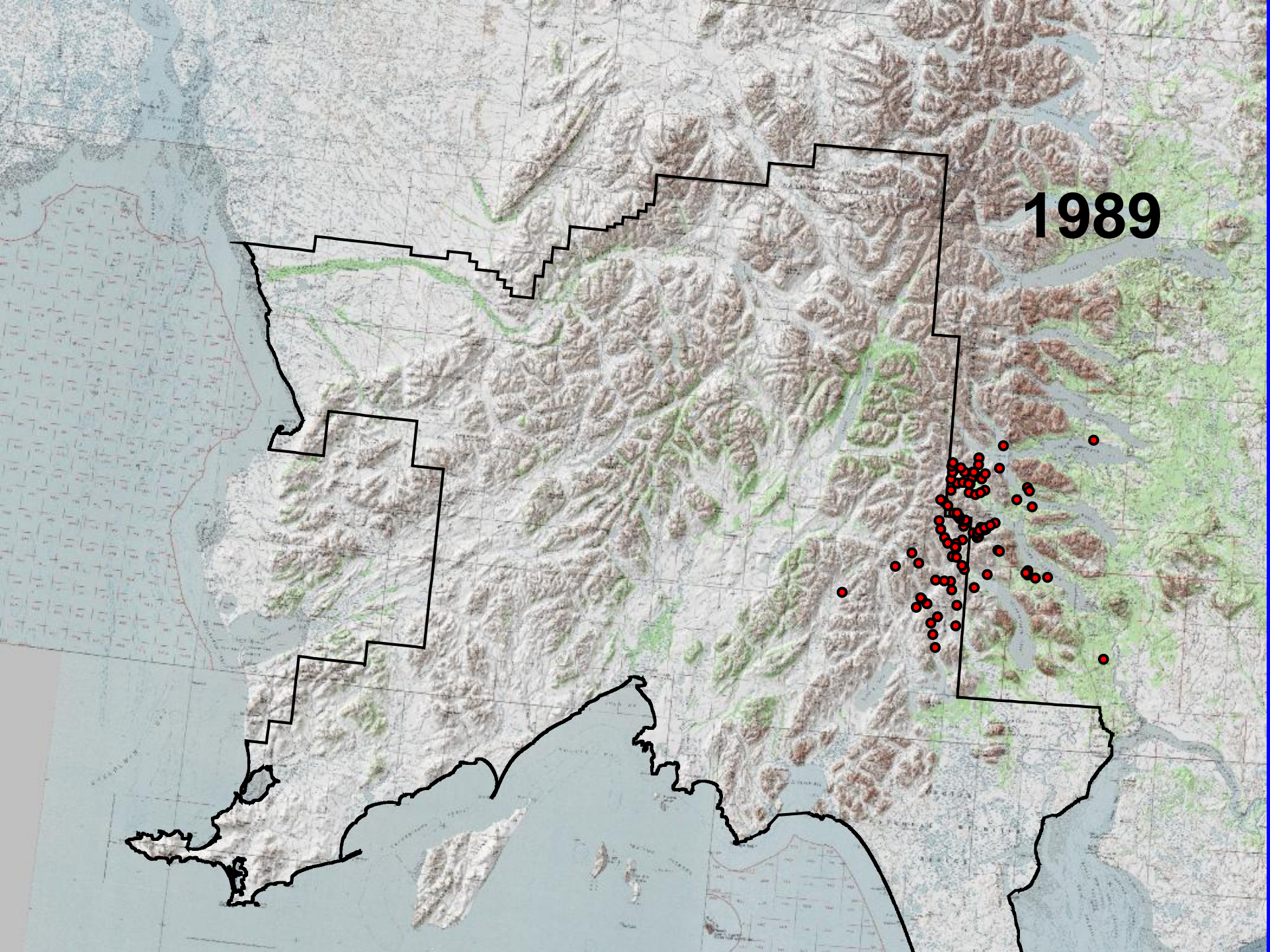




# GMU 17A moose counts



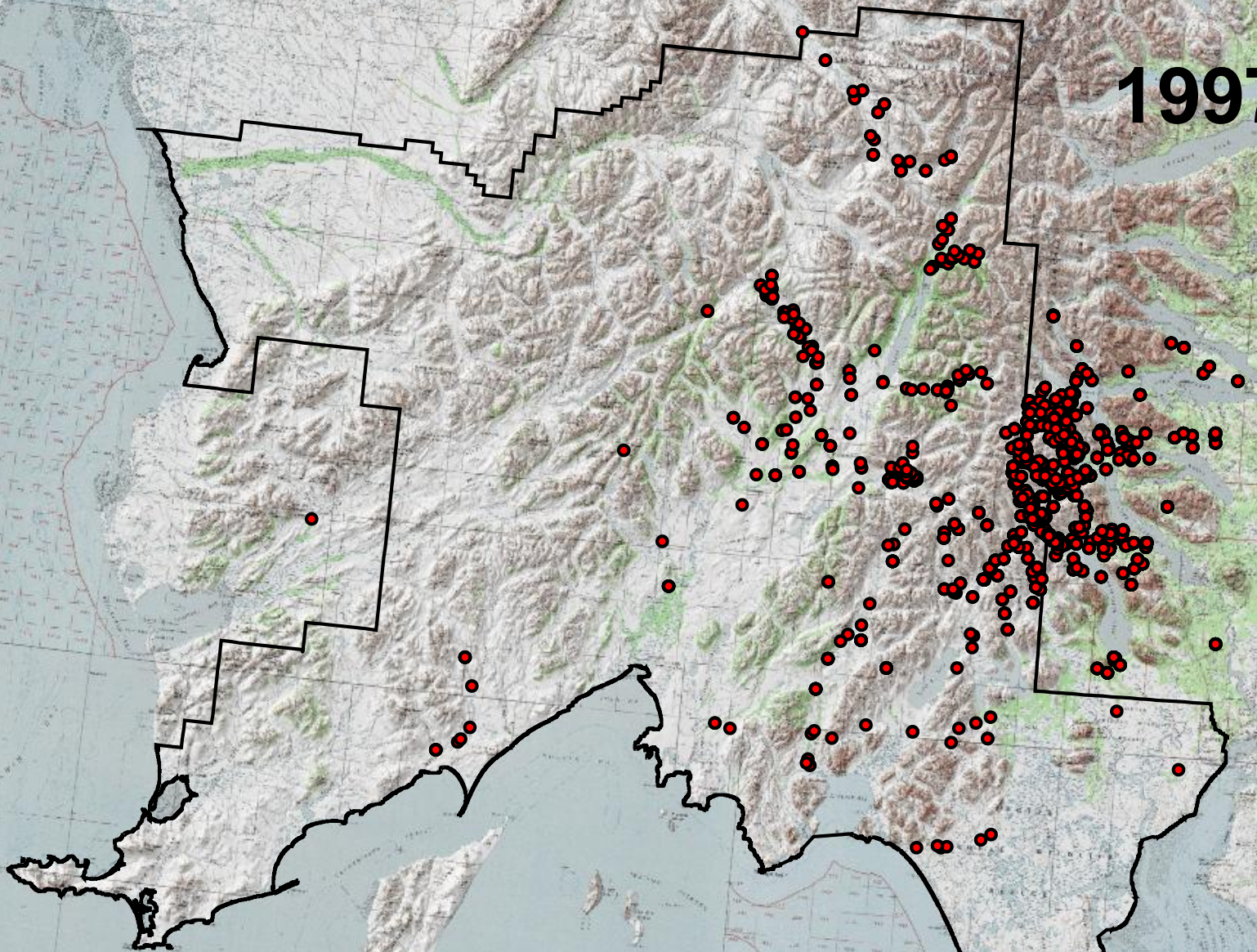




1989

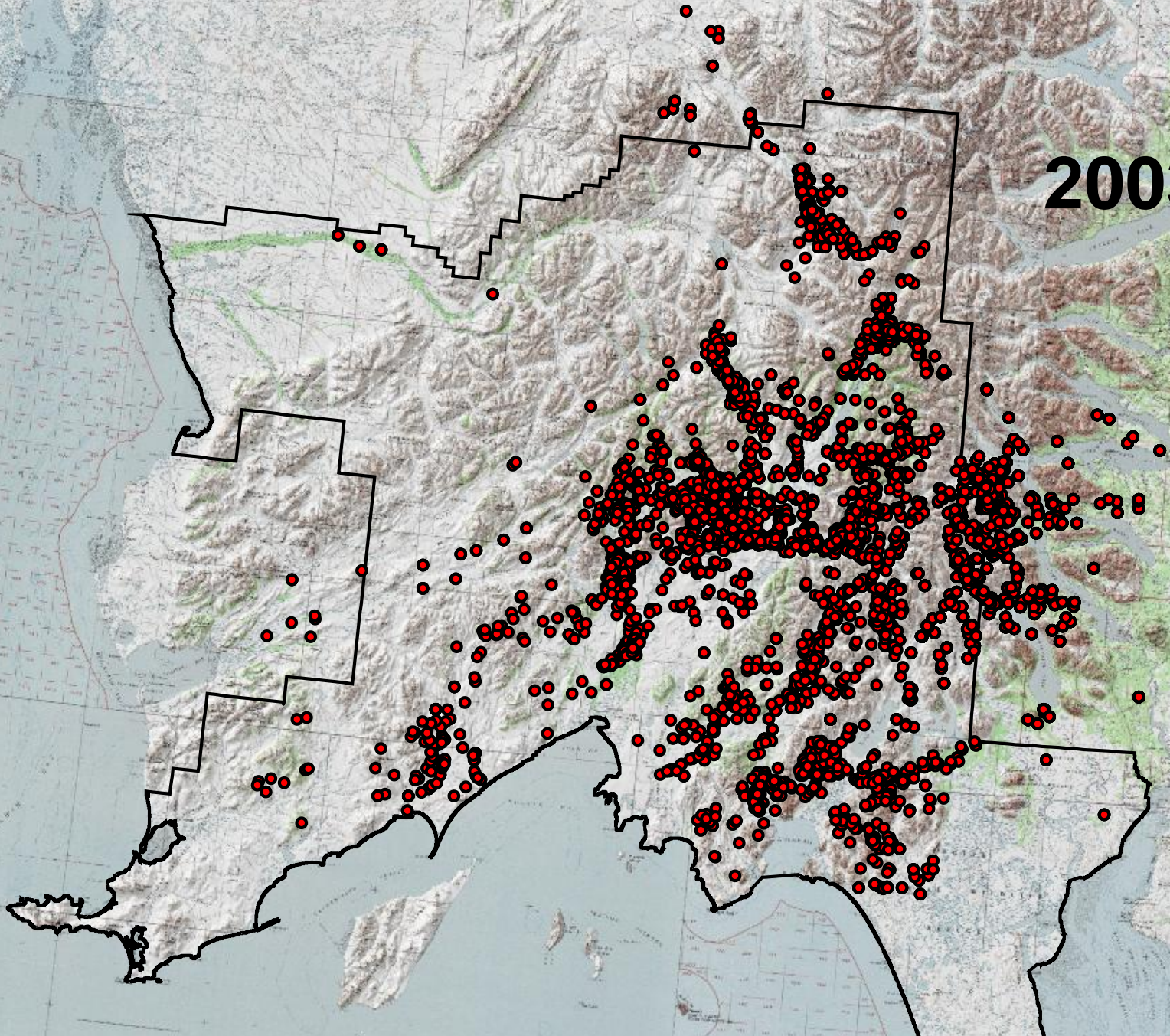


**1997**



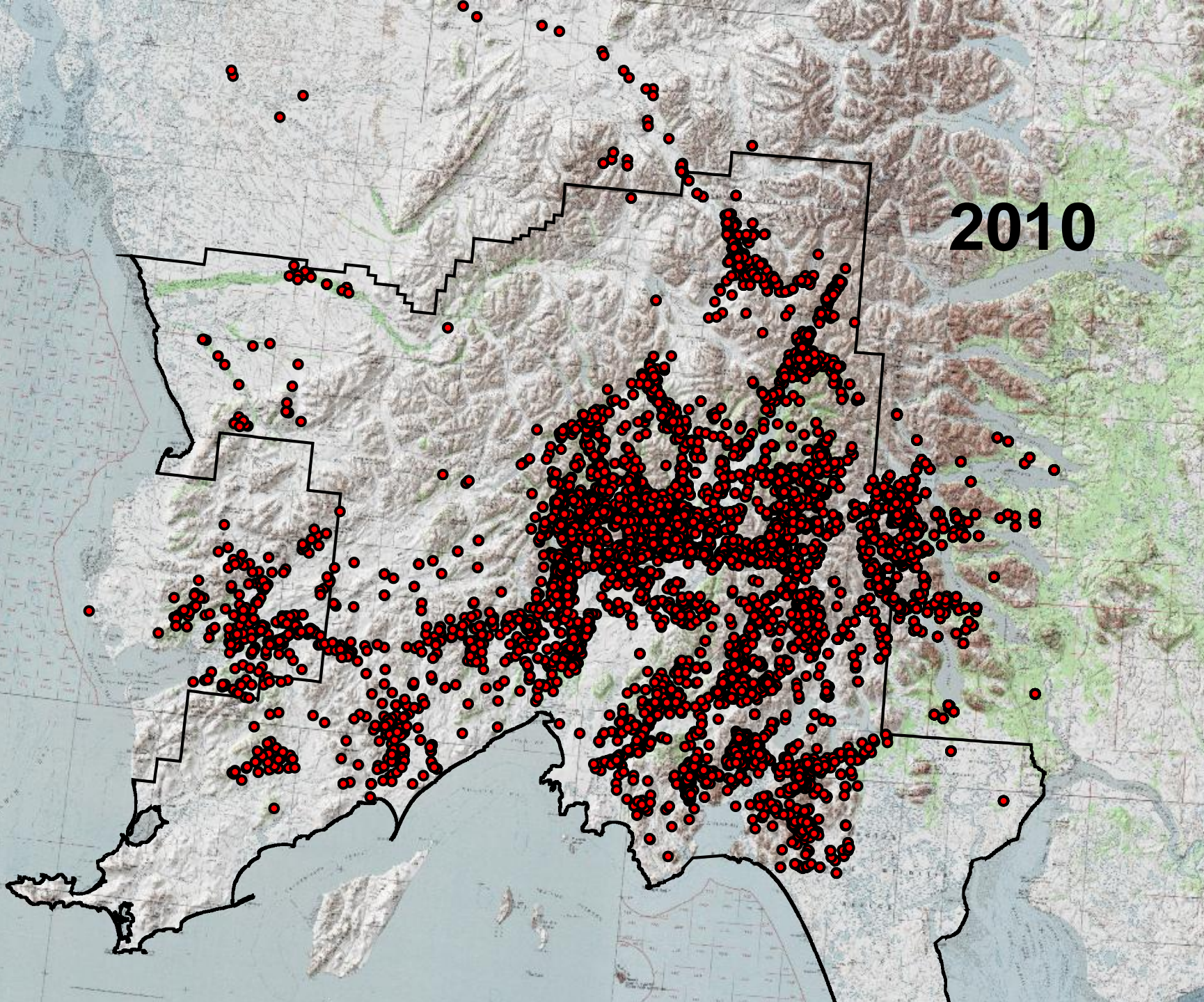


**2003**





**2010**





# **Objectives:**

- 1. Monitor annual calf production and fall recruitment.**
- 2. Estimate body weight of 11-month old females.**
- 3. Estimate age at first parturition.**





# Methods:

**Calf production/recruitment, weight of 11-month old females, and age at first parturition**







**Adult females:  $n = 48$**

**1998 – 27      2006 - 1**

**2000 – 10      2007 - 1**

**2002 – 5      2008 - 1**

**2004 – 3**





**11-month old females:  $n = 40$**

**2002 – 10 weights, 5 collared**

**2003 – 15 weights & collars**

**2008 – 15 weights & collars**



## Analyses:

Production = total # calves born in May-June/total # radioed females in May-June X 100.

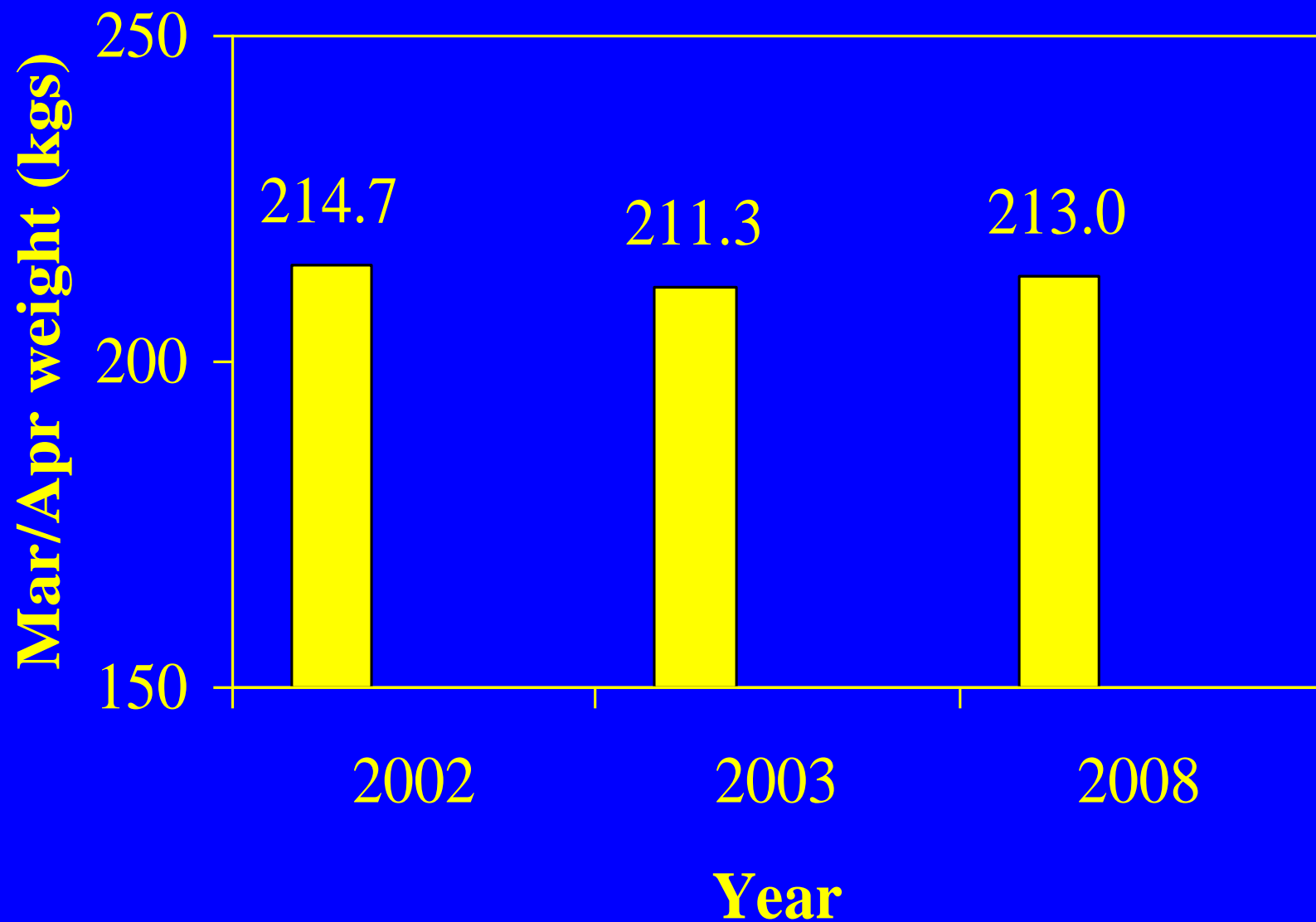
Twinning = proportion of producing females that gave birth to twins or triplets.

Recruitment = total # calves alive in Nov/total # radioed females alive in Nov X 100.

Production, twinning, and recruitment analyzed separately for 2-year olds and adult females  $\geq$  3-years old.

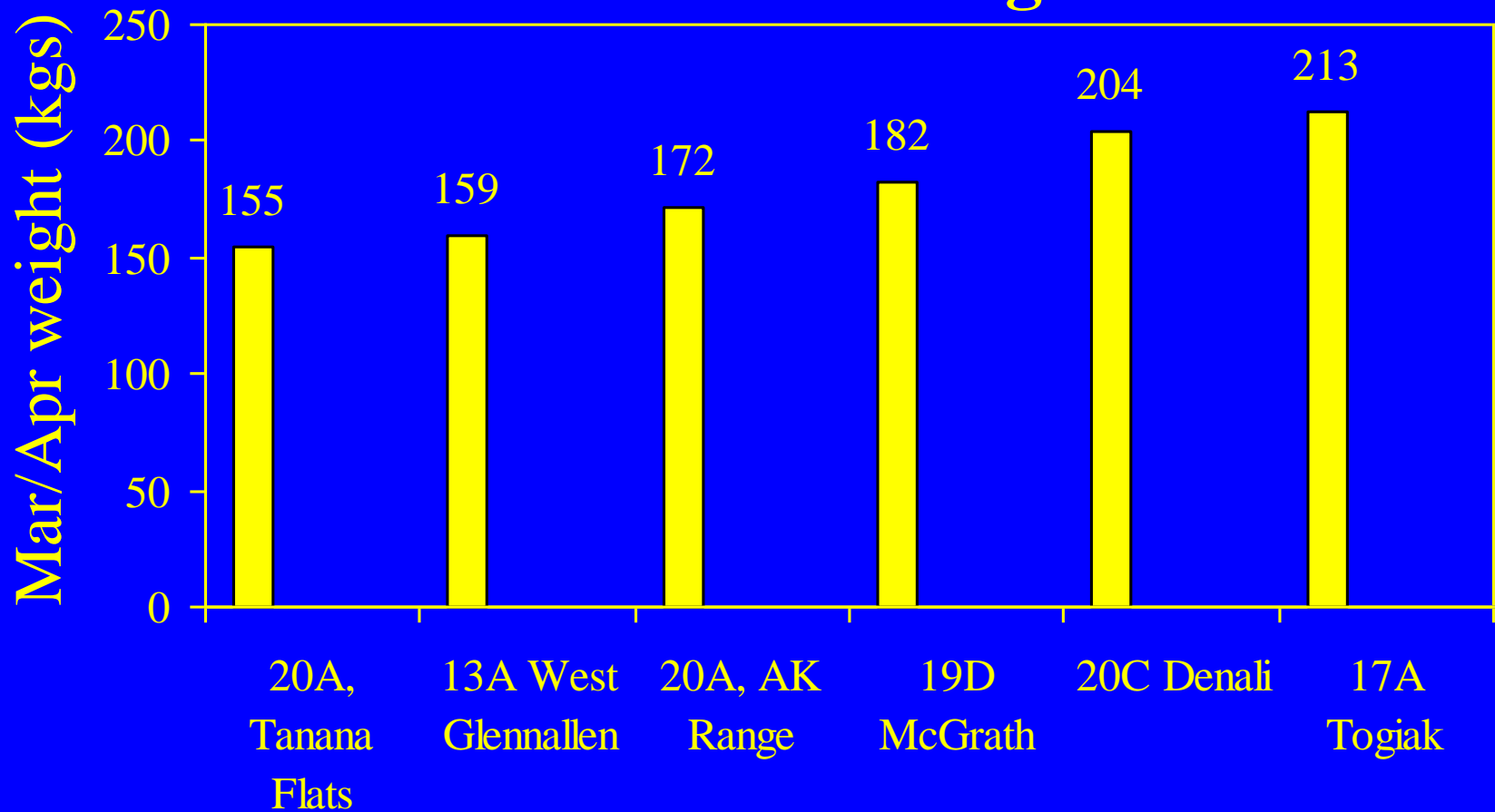


# Togiak Refuge female calf weights





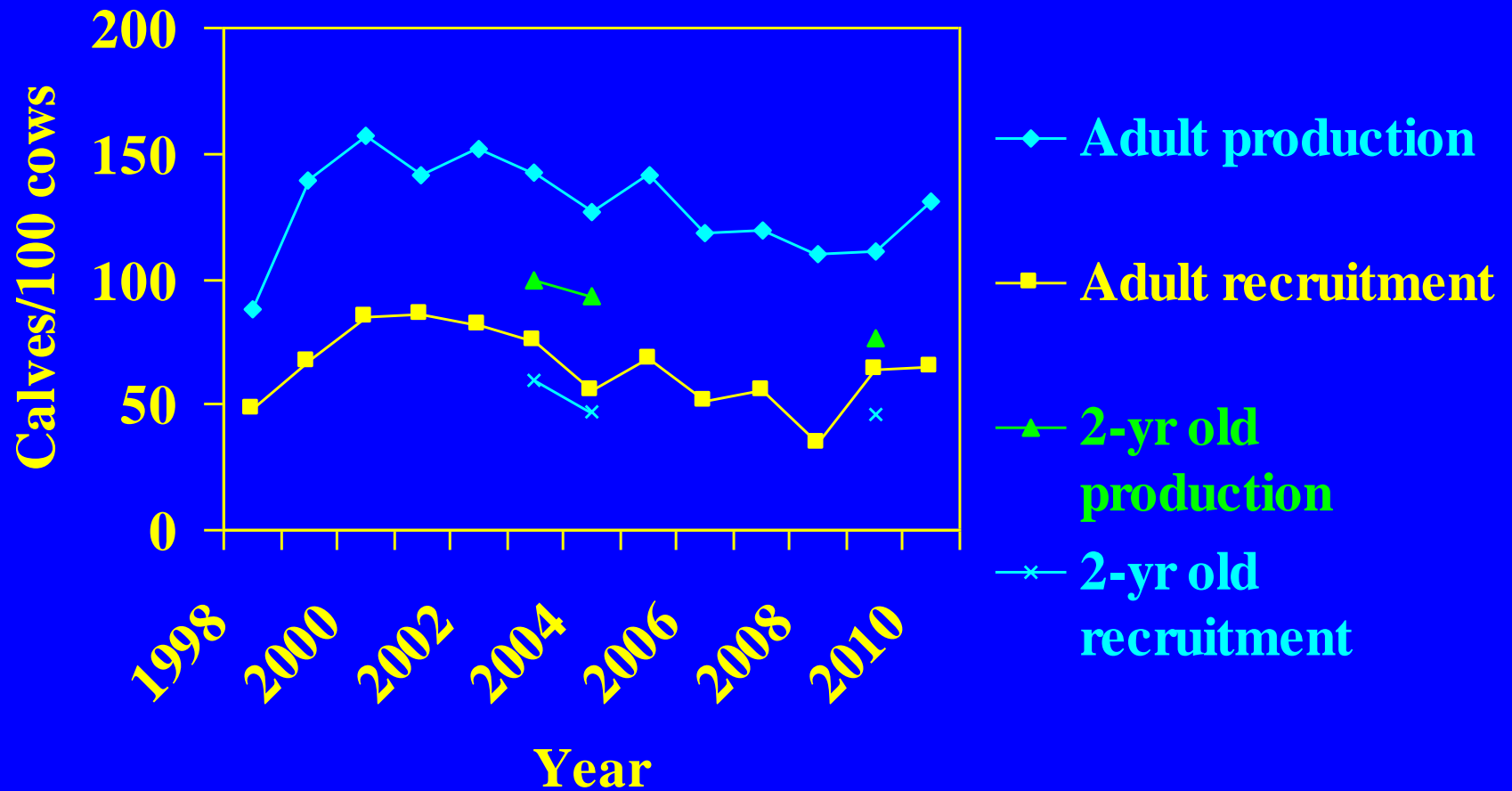
## Alaska female calf weights



Alaska Game Management Unit



# Calf production/fall recruitment





**On average, 78% of adult females were observed with newborn calves in Spring, of which 65% had twins (including 3 sets of triplets!)  
= 129 calves produced per 100 adult females**





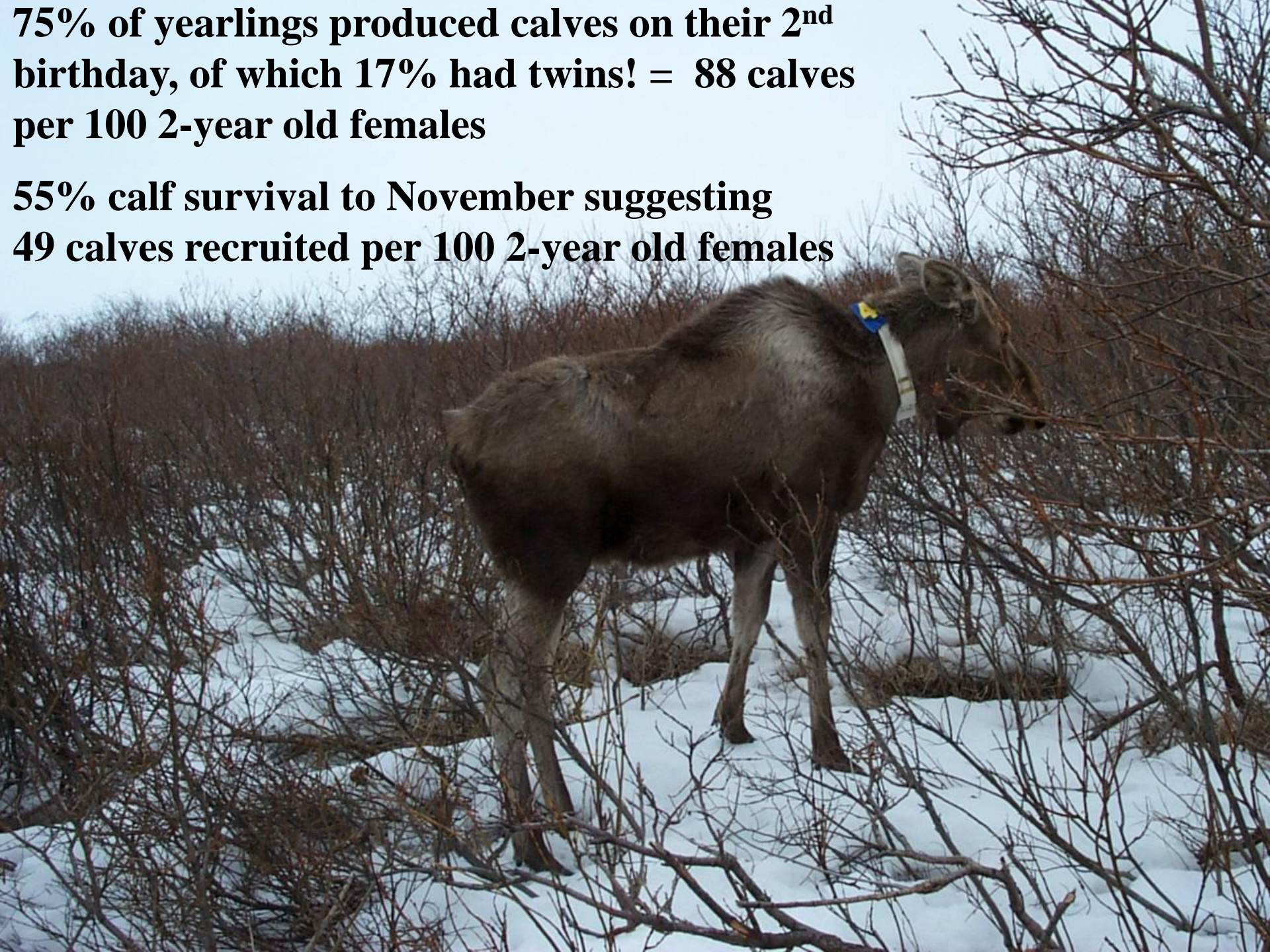


**Calf survival from birth until November averaged 48%  
suggesting a fall recruitment rate of 64 calves per 100 adult females**



**75% of yearlings produced calves on their 2<sup>nd</sup> birthday, of which 17% had twins! = 88 calves per 100 2-year old females**

**55% calf survival to November suggesting 49 calves recruited per 100 2-year old females**





# **Management Implications:**

**Moose expansion to west and north**

**Increased harvest opportunities**

**Increased predator populations?**





# **Acknowledgements:**

**Togiak Refuge staff**

**ADF&G staff**

**Traditional Councils of:  
Goodnews Bay, Platinum,  
and Togiak**

**Tucker Aviation**

**QuickSilver Air**

**The End**

